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## A NOTE ON THE COMPENSATION OF ODORS

By E. B. TITCHENER

In his recent discussion of the compensation of odors, Dr. Henning refers to my work in terms which make a correction necessary.<sup>1</sup>

(1) After remarking that in my *Experimental Psychology* I follow Zwaardemaker—which is quite true—Dr. Henning writes: "ob indessen irgend eine Vp. dabei die Geruchslosigkeit wirklich feststellte, das erfahren wir nicht."

My critic is mistaken. I say that "not every student can get a compensation effect in every experiment;" I emphasize the instability and impermanence of the experimental compensations; I give Zwaardemaker's compensation ratios, and point out that the Cornell results do not always agree with those of Zwaardemaker; and I quote—with the statement "the following are typical laboratory results from two observers"—the records of actual compensations of india rubber by cedarwood and of india rubber by gum benzoïn. "In these, and many similar cases," I proceed, "true compensations were found. . . . The nothingness cannot be kept for more than an instant, but it can be refound without difficulty in another trial." Again, after stating that "according to Zwaardemaker all the substances recommended for this experiment are compensatory substances," I add in a footnote: "we can bear out this statement for all the substances but Russian leather."<sup>2</sup> I do not know how I could have shown more plainly that the observers in my laboratory had had experience of olfactory compensation.

(2) Dr. Henning continues: "In seinem Lehrbuch [i., 122] bemerkt er ganz im Gegenteil, dass eine Geruchslosigkeit nicht auftritt, sondern dass zum mindesten der stärkere von zwei Gerüchen wahrgenommen wird, wobei er als Beispiele gerade diejenigen Riechstoffpaare nennt, für die Zwaardemaker das gänzliche Fehlen jedes Geruches behauptete."

I say, on the contrary, that compensation does take place; the paragraph on p. 122 of the *Lehrbuch* follows p. 131 of the *Experimental Psychology*. I add on p. 123 (still following the *Experimental Psychology*): "Der Versuch zeigt, dass zwei Gerüche sich nur selten länger als wenige Sekunden lang kompensieren; es ist leicht, einen ungesättigten Geruch von der Qualität der stärkeren Komponente zu erhalten, aber nicht leicht, eine wirkliche Auslöschung zu erzielen." There is no change of standpoint from the one book to the other.

(3) Dr. Henning mistrusts the olfactometer, and himself finds no trace of complementarism among odors. Whether this conclusion is sound, and our transitory compensations are due to errors of technique, I am not yet prepared to discuss. The object of this Note is to prove that he has misread me, both in English and in German.

<sup>1</sup> H. Henning, *Der Geruch*, ii., *Zeits. f. Psychol.*, lxxiv., 1916, 309.

<sup>2</sup> *Experimental Psychology*, I., ii., 1901, 133 ff.

In case, however, that other psychologists should care to repeat Zwaardemaker's experiment, I again call attention to the fact that we have not always been able to verify his compensation ratios. Our results, it is true, were obtained in the course of regular laboratory practice; but they are probably as reliable as results from relatively untrained observers can be. I give an illustration. According to Zwaardemaker, 10 cm. india rubber = 5.5 cm. cedarwood. The figures quoted in my *Experimental Psychology* as typical of our own work are  $5.5 \pm 0.8$  and  $5.65 \pm 0.15$  cm. cedarwood. I find in our records, however, a case (March 9, 1900) in which 10 cm. india rubber =  $1.44 \pm 0.3$  cm. cedarwood. Neither experimenter nor observer knew anything of Zwaardemaker's ratio. The observer, who had already worked with india rubber, remarks: "The odor of the india rubber seemed a little weak," and the experimenter adds: "Perhaps on account of the weather, as it was a clear, cold day."